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Tabish Shah Mohsin <tabishshah0786@gmail.com>

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rfid door lock
1 message

AUV ZHCET <auvzhcet@zhcet.ac.in>   30 January 2025 at 17:38
To: Tabish Shah Mohsin <tabishshah0786@gmail.com>, Mohammed Zaid Ali <mohdzaidali2006@gmail.com>

Below is a **concise wiring list** matching the **final code** you shared, where:

- The **keypad** uses `'*'` as "Start" and `'#'` as "Stop."
- The **Arduino UNO** reads RFID using an **RC522** (via SPI), drives a **single relay** that switches 12 V power to the actuator, and checks a **4×4 keypad** for passcode input.

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1. Arduino Pin Usage (Overview)

Function	Arduino Pin	Notes
Keypad Row 1 (R1)	A1 (analog pin)	
Keypad Row 2 (R2)	A0 (analog pin)	
Keypad Row 3 (R3)	7	
Keypad Row 4 (R4)	6	
Keypad Col 1 (C1)	5	
Keypad Col 2 (C2)	4	
Keypad Col 3 (C3)	3	
Keypad Col 4 (C4)	2	
RFID RST	8	Reset pin for RC522
RFID SDA (SS)	10	SPI SS pin for RC522
RFID MOSI	11 (HW SPI)	MOSI (hardware SPI pin on an UNO)
RFID MISO	12 (HW SPI)	MISO (hardware SPI pin on an UNO)
RFID SCK	13 (HW SPI)	SCK (hardware SPI pin on an UNO)
Relay Input (IN)	A2 (analog pin)	Drives the relay coil (through the relay module's input pin). Often digital pin #16 on UNO.
5 V (for Relay module)	5 V pin	Relay VCC if it's a 5 V relay module.
3.3 V (for RC522)	3.3 V pin	The RC522 typically requires 3.3 V power (check your module).
GND	GND	Common ground shared with Arduino, relay module, RC522, and 12 V power supply.

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2. Keypad Wiring Detail

Your **4×4 keypad** has 8 pins: 4 for rows, 4 for columns. In the **final code**, we have:

```
// Adjusted for your final code
byte rowPins[ROWS] = {A1, A0, 7, 6};  // Row1->A1, Row2->A0, Row3->7, Row4->6
byte colPins[COLS] = {5, 4, 3, 2};    // Col1->5,  Col2->4,  Col3->3,  Col4->2
```

So wire them as follows:

Keypad Label	Arduino Pin
Row 1 (R1)	A1
Row 2 (R2)	A0
Row 3 (R3)	7
Row 4 (R4)	6
Col 1 (C1)	5
Col 2 (C2)	4
Col 3 (C3)	3
Col 4 (C4)	2

(If your keypad pins are not labeled R1–R4, C1–C4 in that order, you can test continuity or consult the keypad datasheet. As long as the code's row/column mapping matches the physical wiring, it will work.)

3. RC522 RFID Wiring

Most RC522 modules have these pins:

- **SDA** (sometimes labeled **SDA/SS**)
- **SCK**
- **MOSI**
- **MISO**
- **IRQ** (not used by this code)
- **GND**
- **RST**
- **3.3 V** (or VCC)

Connect them to the Arduino as follows:

RC522 Pin	Connect To	Notes
SDA (SS)	Pin **10**	Defined in code as SS_PIN
SCK	Pin **13**	Hardware SPI clock on UNO
MOSI	Pin **11**	Hardware SPI MOSI on UNO
MISO	Pin **12**	Hardware SPI MISO on UNO
IRQ	*Not used*	Leave unconnected or per module's instructions
RST	Pin **8**	Defined in code as RST_PIN
3.3 V	Arduino **3.3 V**	RC522 typically requires 3.3 V (check your module for any built-in regulator).
GND	Arduino **GND**	Common ground

4. Relay Module & Actuator Wiring

Single SPDT Relay Module: Usually has 3 low-voltage pins: (VCC, GND, IN), and 3 high-voltage terminals (NC, COM, NO).

4.1. Relay "Coil/Logic" Side

- **Relay VCC → 5 V** from Arduino (if it's a 5 V relay module)
- **Relay GND → Arduino GND**
- **Relay IN → A2** (the code's RELAY_PIN)

  If your relay module is **active LOW**, then writing LOW energizes the coil. The code sets

`relayIsActiveLow = true;`. If your module is active HIGH, set `relayIsActiveLow = false;`.

4.2. Relay "Switching" Side (for the 12 V Actuator)

Your actuator has two leads; it **unlatches** when powered at 12 V and **re-latches** automatically when unpowered. We only need a single SPDT relay to switch power on/off:

1. **COM** → +12 V from your external **12 V power supply**
2. **NO** → One lead of the actuator
3. The **other lead** of the actuator → **12 V supply GND**
4. **NC** is unused in a simple "off by default" scenario

How it works:

- Relay **OFF**: COM is disconnected from NO → no voltage to actuator → latch is closed.
- Relay **ON**: COM is connected to NO → +12 V flows through actuator → latch opens.

  Common Ground: The 12 V supply's GND must be connected to the **Arduino GND** and **relay module GND** for signals to reference properly.

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5. Powering the RC522 & Relay

1. **RC522**: Usually **3.3 V** from the Arduino. If your module explicitly supports 5 V input (has onboard regulator and level shifting), it can be powered at 5 V, but most require 3.3 V.
2. **Relay Module**: Typically **5 V** for the coil. Some modules are 12 V coil, so check your relay's spec. If it's a 5 V relay module, supply it from Arduino's **5 V** pin.
3. **Actuator**: A **separate 12 V supply** (capable of the required current). The relay switches this supply's +12 V line.
4. **Ground**: Tie the Arduino GND, RC522 GND, Relay GND, and 12 V supply GND **all together** as a common reference.

Summary of Connections

1. **Keypad** → Arduino pins (`A1, A0, 7, 6`) for rows, (`5, 4, 3, 2`) for columns, matching your final code.
2. **RC522** → Arduino pins (`10, 8, 11, 12, 13, 3.3 V, GND`) as described.
3. **Relay** → Arduino pin **A2** (IN), 5 V to VCC, GND to GND.
4. **Actuator** → Relay's **COM** from 12 V supply +, **NO** to actuator lead, other actuator lead to 12 V supply GND.
5. **Arduino GND** tied to **relay GND** and **12 V supply GND**.

Once wired this way, with the **final code**, pressing `'*'` initiates passcode entry, pressing `'#'` checks it, or scanning an authorized RFID opens the door for 5 seconds.

📄 **RFIDdoorLock.ino**
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